REMARKS

The Office Action dated February 25, 2003, has been noted and its contents carefully studied. In light of the following remarks, and the amendments made herein, reconsideration of the rejection under 35 U.S.C. 103 is courteously requested.

In order to facilitate the Examiner's consideration, prior to discussing the cited references and the merits of the Office Action, a discussion of the invention is presented herein.

In one aspect, the invention is directed to a circuit for coupling to electromagnetic waves for having current flow induced throughout the circuit. The circuit includes a substrate for supporting components of the circuit and at least one switch which includes a first conductive element on the substrate for connection to a first component of the circuit and a second conductive element on the substrate for connection to a second component of the circuit. A switch element is made up of a switching material on the substrate and connects the first and second conductive elements. The switching material is a compound which exhibits a bi-stable phase behavior, and is switchable between a first impedance state value and a second impedance state value by application of energy thereto to thereby affect current flow between the first conductive element and the second conductive element as a result of the change in the impedance value of the compound.

As further recited in new independent claim 35, the circuit further comprises a grid of first and second conductive elements that are spatially arranged for coupling to electromagnetic waves. Claim 51 further recites the grid as being arranged to form a frequency selective array for coupling to electromagnetic waves.

As to other features of the invention, they are clearly set forth in the dependent claims and self evident therefrom.

It is respectfully urged that the invention as recited in the original claims, in the claims added in the response to the previous Office Action, and the newly added claims, is not taught or suggested under 35 USC 103 by the cited references standing alone or in the combination proposed by the Examiner, as will become more clearly evident from the following detailed discussion of these references presented herein for the Examiner's kind consideration.

U.S. Patent No. 3,918,032 to Nicolaides

U.S. Patent No. 3,918,032 to Nicolaides (hereinafter Nicolaides) discloses a two terminal amorphous semiconductor device which exhibits memory characteristics in one polarity and threshold switching in the opposite polarity when a pulsating AC half wave voltage signal is applied to its terminals. The device includes an amorphous chalcogenide thin film sandwich positioned on an electrically insulating substrate of silicon oxide.

In its actual physical arrangement, the device includes a silicon substrate having a silicon oxide layer thereon, upon which a thin film, bottom electrode member is deposited. A second silicon oxide thin film layer having an orifice etched therein covers a portion of the bottom electrode member and extends over one edge of the bottom electrode member. A small rectangularly-shaped amorphous chalcogenide thin film is vacuum deposited on the second silicone oxide layer so that it covers and extends into the orifice. A half wave pulsating AC voltage can be applied to the top electrode connector in a manner so that it has a negative polarity with respect to the bottom electrode, and when the applied voltage exceeds a threshold voltage at a certain point, the device switches to cause the device to operate in memory mode.

While generally disclosing the use of chalcogenide materials in connection with a semiconductor switch in memory, this has nothing to do with the claimed invention other than for the commonality of a use of the chalcogenide material. More specifically, as already previously noted, the invention in its broadest aspect is directed to a circuit for coupling to electromagnetic waves for having current inflow induced through the circuit. Nicolaides does not teach a circuit, and standing alone or in combination with the other references to be discussed hereinafter, does not render obvious the claimed invention.

Further, as recited in new claim 35, there is nothing in Nicolaides which teaches or suggests the further feature of the circuit comprising a grid of first and second conductive elements that are spatially arranged for coupling to electromagnetic waves, and as further recited in claim 51 wherein that circuit and grid is arranged to form a frequency selective array for coupling to the electromagnetic waves.

For the foregoing reasons, it is respectfully urged that the claimed invention is not obvious from the teachings of Nicolaides standing alone or in combination with the other references disclosed discussed hereafter.

U.S. Patent No. 4,092,060 to Nunoshita, et al

U.S. Patent No. 4,092,060 to Nunoshita, et al (hereinafter Nunoshita) merely discloses a thin film optical switching device. With respect to its use of chalcogenide material, contrary to the Examiner's assertions, it is respectfully urged that Nunoshita does not teach switching electromagnetic waves. More specifically, in one embodiment Nunoshita teaches that the thin film is formed of any suitable material having a high value of M for example, chalcogenide or arsenic sulfide glass for the purpose of effecting acousto-optical interaction between the material and an adjacent portion of an optical waveguide.

In this regard, it is noted that arsenic sulfide is functionally equated with chalcogenide and provides a different function than that of the chalcogenide in Applicants' claims. This different functionality results from the fact that the chalcogenide material described in Nunoshita is structurally different from the chalcogenide material that exhibits the bi-stable phase behavior change according to the pending claims. Since the material described in Nunoshita does not exhibit the claimed "bi-stable phase behavior" and cannot perform the claimed function of "switch[ing] between a first impedance state value and a second impedance state value by application of energy thereto," it is respectfully urged that Nunoshita fails to teach or suggest these limitations.

Moreover, the field of the invention of Nunoshita is quite different from that of Nicolaides, i.e., a thin film optical switching device used in an optical waveguide, as contrasted to the amorphous semiconductor switch and memory with a crystallization-accelerating layer of Nunoshita. As such, there is no motivation for those of ordinary skill in the art to combine the teachings of the two references.

Further, even if there were motivation to combine the teachings of the two, one of ordinary skill in the art would still not arrive at Applicants' claimed invention, and it is respectfully urged that the Examiner has reached the conclusion concerning obviousness of the claimed invention only in a hindsight interpretation of the

reference if calculated to arrive at Applicants' claim. It is also well-established law that such hindsight interpretation of the references is impermissible and improper.

Thus, for the foregoing reasons, it is respectfully urged that the claimed invention is clearly patentable over the combination of Nicolaides and Nunoshita proposed by the Examiner.

U.S. Patent No. 6,391,688 to Gonzalez, et al

U.S. Patent No. 6,391,688 to Gonzalez, et al (hereinafter Gonzalez) discloses a method for fabricating an array of ultra-small pores for use in chalcogenide memory cells (Summary of the Invention). Contrary to the Examiner's position, it is respectfully urged that Gonzalez does not disclose an array of chalcogenide-type switches. Instead, Gonzalez teaches a method of fabricating an array of phase-changeable memory cells such as a chalcogenide memory cell. The chalcogenide memory cell includes a lower electrode layer, a dielectric layer including a single pore, a layer of chalcogenide memory material including a chalcogenide active region and an upper electrode layer (column 7, lines 9-13). By providing for pores, a group of four closely-spaced chalcogenide memory cells may be provided. The use of all four pores in the memory cell results in a structure that is tolerant of mis-alignment in the previous masking processes since the total cross sectional areas of the pores used will be constant (column 7, lines 35-41). Thus, as may be appreciated, this has nothing to do with Applicants' claimed invention and adds nothing to the teachings of Nicolaides or Nunoshita other than for the general use of chalcogenide material in specific applications.

Applicants have already discussed that chalcogenide materials have been known for use in specific applications, but none of the references disclose such a use in the specific manner arranged by Applicants in a circuit for coupling to electromagnetic waves for having current flow induced throughout the circuit.

CONCLUSION

For the foregoing reasons, it is respectfully urged that the claimed invention is clearly patentable. Nonetheless, should the Examiner have any comments, questions or suggestions of a nature necessary to expedite prosecution of the application or to place the case in condition for allowance, he is courteously requested to telephone the undersigned at the number listed below.

Respectfully submitted,

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RALLIB01:682535.1